Comparing Permit Allocation Options: The Main Points

By Peter Bohm[1]

April, 2002

Abstract

In discussions about the policy design of domestic emission trading, e.g., when implementing the Kyoto Protocol, the two permit allocation alternatives – auctioning and allocation *gratis* (grandfathering) – are often pitted against each other as representing utopian cost-effectiveness and political realism, respectively. In this note, an attempt is made to extract the main points of a comparison between the two options with respect to efficiency and distribution.

Keywords: Domestic carbon emissions trading, permit allocation, grandfathering, auctioning, cost effectiveness, Kyoto protocol

JEL codes: Q25, Q28

[1] Email address: pb@ne.su.se. I am indebted to Bjorn Carlén for helpful comments on an earlier draft.

How should permits be allocated to attain efficiency in a domestic carbon emissions trading system? The arguments that surface most frequently *pro* and *con* giving away permits for free instead of auctioning (selling) them are reviewed here. The term grandfathering (GF), which reflects the idea that permit-liable entities should be allocated permits in some relation to past emissions, is used here to cover any kind of principle for gratis allocations.[2] To begin with, as a baseline case, revenue from govemment permit auctions is assumed to be used for tax reductions.

Before reviewing the arguments two circumstances should be noted.

(NI) "*The location of permit liability has little importance for the final location of costs."* - The government can choose where to locate permit liability in the product chain and thus who has to cover eventual emissions by permits that carry a market price. Still, the emissions cost implied by the permit price tends to be shifted both forward to downstream units, if any, and backward to upstrearn units, if any, via shifts in supply and dernand. The real cost that is placed on the economy as a result of a reduction of carbon emissions is ultimately borne by consumers, labor and owners of capital. The real effects of a given binding permit volume, hence of a given aggregate emissions reduction, tend to be the same regardless of the location of permit liability. Specifically, if all carbon in fossil fuel is eventually released into the atmosphere, it does not matter whether permit liability is placed on fossil fuel producers and importers, wholesale dealers, refineries, distributors, or fossil-fuel users. Therefore, the efficient choice of permit liability is essentially that where transaction costs is at a minimum.

(N2) *"Permit prices and incentives are independent of the allocation option."* Regardless of whether a given volume of permits is auctioned or grandfathered, the permit price tends to be the same. At least, this is the case in the absence of any significantly different effects of the final wealth (or income) resulting from the two approaches, auctioning (A) and GF. Specifically, grandfathered permit-liable entities that reduce their demand for permits do not need to buy more permits or can sell an excess volume of permits, thus making the incentive effect on fossil-fuel/carbon use the same as when all permits have to be purchased. In other words, the fact that certain entities get a sufficient amount of permits for free does not mean that their incentives to reduce emissions are any different from those who have to buy permits. Thus, absent any indirect effects on efficiency in the economy, the effect of the choice between the two options is on the wealth (or income) distribution only.

Arguments and issues:

[2] If related to a variable, such as *current* (share of) electricity consumption or production, GF emerges as a subsidy of consumption/production along with the (implicit) permit price on emissions. (This case, when used in Burtraw et al., 2001, is copied on the Swedish revenue-neutral NOx tax on (large) boilers, the revenue of which is redistributed to them in proportion to their current electricity output.)

1. Initially, at least, permits should be grandfathered?

Governments that favor auctioning of permits may find that certain entities have not been forewarned early enough to be confronted by one hundred percent auctioning right from the beginning. In principle, there is no problem with shifting between (various combinations of) the two allocation designs over time – in particular, if such shifts are announced early enough.[3]

2. Grandfathering is the allocation method predominantly used in practice and therefore the most efficient?

Since tradable permits (TPs) have been used almost exclusively in US environmental policy, the use of grandfathered permits is a reflection of the political choices made there. In itself, this fact signifies only that the US government has preferred this particular allocation method, e.g. on grounds of political feasibility. It does not necessarily reflect any efficiency considerations, if such considerations had been allowed to play a decisive role.

3. Grandfathering is used for emissions trading initiated by business.

In some countries the business sector has initated carbon emissions trading. When the government later enters the field to implement an emissions trading scheme in line with, say, its Kyoto commitments, it may face an emissions trading system already in operation that is suitable for this purpose and where allocations are gratis. For a govermnent that prefers a system of auctioned permits, attaining this would now require more political power. This is, of course, one possible reason why business has chosen to precede government in having emissions trading introduced.

4. Upstream permit liability and grandfathering?

For reasons of transaction costs, placing permit liability upstream would be efficient (see N1 above), provided that the resulting permit market is competitive. Then, if grandfathering permits to permit-liable entities were the preferred choice of allocation on purely political grounds, upstream allocation of carbon permits to these entities would imply a wealth transfer to fossil-fuel importers and producers only. When such a wealth transfer is politically unacceptable, it becomes difficult to combine GF to permit-liable firms with the efficient upstream allocation of permit liability.

5. Upstream liability and downstream grandfathering?

GF does not necessarily mean that the permits are given to permit-liable entities. If an upstream allocation of liability is combined with an initial allocation of permits to some other party, e.g.,

[3] The proposed partial EU trading system for 2005 – 2007 is often taken to have permits allocated gratis. This presumption or recommendation may cause two particular types of complications. One is that Parties then may meet political resistance to a later 'change' of the allocation system to A that need not have existed if (some share of) A had been used right from the beginning. Another, somewhat opposite, problem arises if countries that now have carbon tax systems installed should 'have to' (meet political pressure to) give permits away for free during 2005 – 2007 instead of simply replacing the carbon taxes by auctioned permits for those parties that now shift from being tax liable to being permit liable.

downstream firms or households, efficiency would no longer be blocked. In this case, the initial holders of permits would sooner or later sell their permits to permit-liable upstream entities. However, this option may be more efficiently designed as an auction, where the permit-liable units end up paying the same expected permit price (if the auction is collusion-proof) and where auction revenue is distributed to those that otherwise would have received permits for free. Should political considerations preclude anything else than GF, the resulting rule would be to place permit liability where it is efficient and give the permits to whomever the government wishes to compensate.

6. Matching others' grandfathering is necessary to safeguard international competitiveness?

If, in particular, large Parties to the Kyoto Protocol use GF, competing countries could argue (and some countries have done so) that they cannot use auctions (or emissions taxes) without overly hurting their industry. This is hardly correct. In both cases, firms are hurt by the fact that it costs them a permit price to emit a marginal unit of carbon, which influences their decisions on prices, output and technology. The difference between the cases is in the wealth distribution; permit wealth is transferred to government in the A case and to households or certain parts of industry in the GF case.[4] Therefore, strictly speaking, GF has no meaning for the industry's international competitiveness. This is obvious if GF is made to households or fossil-fuel producers/importers. If made to manufacturers, the wealth transfer means only that some now inefficient firms may remain in business as a result of the transfer (see further below).

7. Does auctioning make firms emigrate?

GF does not keep cost-based prices on internationally tradable commodities lower than auctions would, but it could make manufacturing firms favored by GF less interested in moving to other countries. This is true in particular for movements to countries that are expected not to be Parties to an agreement on emissions constraints for quite some time. Crucial for the extent of such movements are how well future policy can be predicted in countries of emigration and immigration.

8. Grandfathering makes the allocation of real investment and R&D inefficient?

Firms that receive permits gratis have more wealth than firms that have to buy all their permits. If capital markets were perfect, i.e., capital costs of borrowing and self-financing were the same and access to borrowing were independent of borrower wealth, the firms' wealth would have no effect on efficiency. However, in the more likely case of imperfect capital markets, access to self-financing implies a competitive advantage (the deep pocket argument). Hence, GF is inefficient in the sense that

[4] Note that GF can hardly be said to provide 'fair' (partial or full) compensation to those negatively affected by the emissions constraints, unless the gratis permits are shared among all of them. Thus, for instance, if there are only two levels, one upstream and one downstream, and permits are grandfathered to one of them – which is a common GF design – those on the other level won't be compensated at all. An alternative to attaining widespread compensation by sharing the permit volume among all those affected is to use auctioning and implement tax reductions so as to attain a politically preferred compensation distribution this way.

capital costs then typically (further) discriminates among firms. Moreover, if firm wealth is particularly important for firms' ability to finance R&D, GF is likely to discriminate in favor of innovation in the recipient firms.

9. Grandfathering tends to support less efficient firms?

(a) With imperfect capital markets, GF implies discrimination against new firms with respect to wealth as well as capital costs. Hence, it will be harder for new firms to enter the market. Since firms that wish to enter the market tend to be more efficient than existing firms, productivity growth will be negatively affected by GF.

(b) If pre-existing firms hold on to their grandfathered permits in order to avoid that permits fall into the hands of their competitors - although this may tum out not to be in their interest – market liquidity would go down and permit prices for new firms would rise even further.

(c) Some firms may remain in business only because they have received wealth from GF. If so, efficiency is reduced, regardless of whether the firms could or could not have salvaged (part of) their grandfathered permit wealth if they shut down.

10. **Auctioning makes it possible to reduce the excess burden of the tax system.**

If an efficient volume of government expenditure has thus far been made impossible by policy constraints on taxes, revenue from permit auctions would allow an increase in efficiency by an increase in such expenditure. If additional government expenditure is not efficient but would still occur when funding is available, the opposite is true. If the revenue from auctions is earmarked for tax substitution, it allows a reduction in pre-existing distortionary taxes. The resulting efficiency gain arises since the alternative way to meet an international commitment to an assigned amount of emissions is to accomplish the emissions reduction by a non-revenue-generating policy, here: grandfathering the given volume of emission permits.[5] Note that establishing a reliable earmarking 'contract' is no trivial matter. Ingenuity may be called for to avoid that other taxes are increased at about the same time simply to circumvent the commitment made and to avoid that legimate tax increases are ruled out. However, taxes can be increased also in the alternative GF case, and possibly as a result of the choice of that option (see further below).

11. **In principle, auctioning can accomplish whatever grandfathering does.**

In the baseline case, auction revenue has been taken to be used for tax reductions while the GF case has been assumed to consist of only the selection of recipients of the permits. Auction revenue could,

[5] A discussion of the so-called tax interaction effect has frequently surfaced in this context. This effect has a significant role to play for the cost of enviromnental policy but not for the difference in efficiency that arises when comparing alternative ways to reach a given environmental policy goal (here: a given assigned arnount of ernissions). The reason is that tax interaction effects, or, more generally, the policy interaction effects, arise not only for revenue-generating environmental policy instruments but also for non-revenue-generating ones (see, e.g., Bohm, 1998).

of course, instead be used for redistribution to firms or households. In principle, it could be redistributed in the same proportions to those who would have received permit wealth from GF. If so, the resulting effects of A and GF would be the same with respect to wealth distribution as well as cost-effectiveness. For example, if permits were grandfathered to households with permit liability located elsewhere, the alternative of auctioning the permits and redistributing the auction revenue lump sum to households would produce the same result.

Furthermore, GF could be tied to certain complementary measures such as taxing the recipient entities in order to capture part of their rents.[6] GF with near full rent capture as compared to A, where in both cases the additional govermnent revenue is used to reduce distortionary taxes, would create roughly the same wealth distribution and the same (maximum) level of cost-effectiveness. As shown by various numerical examples in the literature, the difference in cost-effectiveness may be substantial between this pair of options and the pair in the preceding paragraph with, among other things, no potential for reducing distortionary taxes.

With cases such as those now discussed, it is no longer meaningful to characterize the GF approach as one where wealth is going to the private sector and the A approach as one where wealth is going to the government, since such transfers may be in passing only. The effects of the two approaches are defined only after it has been specified what the auction revenue will be used for, to whom and in what amounts the permits have been grandfathered, and in the latter case to what extent taxes are used to capture the rents. Furthermore, in the final analysis, the resulting wealth/income distribution will depend on exactly what kind of taxes will be used and what kind of (distortionary) taxes will be reduced when additional government revenue is made available for that purpose.

Conclusion

The distribution effects of permit allocation policy can be evaluated only after specifying the allocation scheme used (A or GF to whom) in combination with whatever complementary measures are taken (what auction revenue is used for and to what extent GF is combined with any form of rent capture). This also means that A cannot be said to be generally more cost-effective than GF. It depends primarily on how auction revenue is used and on the efficiency effects raised in point 9. If the choice, as it is often stated, is between GF without (complete) rent capture and A used for a reduction of distortionary taxes, A emerges as the cost-effective option. Note also that the compensation brought about by GF only helps those entities - among households and firms directly or indirectly affected by the appearance of permit prices - that are selected for GF. This selection bias does not exist for A.

References:

[6] The introduction of a tradable permit system for ozone-depleting chemicals in the US was accompanied by a tax on such chemicals. Grafton and Devling, 1996, discuss the effects of various types of such charges.

Bohm, P., International Greenhouse Gas Emission Trading - with special reference to the Kyoto Protocol, TemaNord 1999:506, Nordic Council of Ministers, 1999. Also in: *Efficiency and Equity of Climate Change* Policy, ed. C.Carraro, Kluwer, Dordrecht, 2000

Bohm, P., Public Investment Issues and Efficient Clirnate Change Policy, in: *The Welfare State, Public Investment, and Growth,* eds. H. Shibata and T. Ihori, Springer-Verlag Tokyo, 1998

Burtraw, D., K. Palmer, R. Bharvirkar, and A. Paul, The Effect of Allowance Allocation on the Cost of Carbon Emission Trading, Discussion Paper 01-30, Resources for the Future, Washington, D.C., August 2001

Burtraw, D., Carbon Emission Trading Costs and Allowance Allocations: Evaluating the Options, (A summary of the preceding text), *Resources,* Issue 145, Resources for the Future, Washington, D.C., Fall 2001

Cramton, P. and S. Kerr, Tradable Carbon Permit Auctions: How and Why to Auction Not Grandfather, Discussion Paper 98-34, Resources for the Future, Washington, D.C., May 1998

Grafton, R. and R. Devlin, Paying for Pollution - Permits and Charges, *Scandinavian Journal of Economics,* 98(2), 1996

For additional references to the literature see Cramton and Kerr (1998) and Burtraw et al. (2001)